We claim:

1. A method for mitigating multilayer defects on a reticle for use in an extreme ultraviolet lithography (EUVL) system, comprising:

providing an EUVL reticle that includes a substrate with a thin film coating that has a defect; and

changing the thickness of said thin film coating in the vicinity of said defect.

2. The method of claim 1, wherein said thin film coating comprises a multilayer coating having multiple layer boundaries, wherein the step of changing the thickness of said thin film coating in the vicinity of said defect includes interdiffusing at least one layer boundary of said layer boundaries.

3. The method of claim 1, wherein said thin film coating comprises a multilayer coating having multiple layer boundaries, wherein the step of changing the thickness of said coating in the vicinity of said defect includes altering the density of at least one layer of said multilayer coating.

4. The method of claim 1, wherein said thin film coating comprises a multilayer coating having multiple layer boundaries, wherein the step of changing the thickness of said thin film coating in the vicinity of said defect includes interdiffusing a plurality of said layer boundaries.

5. The method of claim 2, wherein the step of interdiffusing at least one layer boundary includes controlling the multilayer contraction associated with the densification that occurs upon interdiffusion at said at least one layer boundary.

6. The method of claim 5, wherein the step of controlling the multilayer contraction includes activating the step of interdiffusing using a localized energy source.

7. The method of claim 6, wherein said localized energy source comprises an electron beam.

8. The method of claim 7, wherein said electron beam is focused.

9. The method of claim 6, wherein said localized energy source is selected from the group consisting of an electromagnetic beam, an electron beam and an ion beam.

10. The method of claim 9, wherein said localized energy source is focused.

11. The method of claim 6, wherein said localized energy source comprises an electrode.

12. The method of claim 1, wherein said defect comprises a mound or protrusion caused by multilayer deposition over a particle or sleek, wherein said defect is mitigated by decreasing the multilayer film thickness at the position of said defect, or spreading the sides of said mound, thereby reducing the slopes of said defect.

13. The method of claim 1, wherein said defect comprises a depression caused by multilayer deposition over a pit or scratch, wherein said defect is mitigated by increasing the multilayer film thickness at the position of the said defect, or spreading the sides of said depression, thereby reducing the slopes of said defect.

14. The method of claim 1, wherein said thin film coating comprises a reflective multilayer structure.

15. The method of claim 1, wherein said multilayer coating is used as a buffer layer, wherein said EUVL reticle further comprises a reflective multilayer coating deposited on said multilayer coating.

16. The method of claim 1, wherein said multilayer coating comprises Mo/Si.

17. The method of claim 5, wherein said densification comprises silicide formation.

18. The method of claim 9, further comprising controlling the decrease in thickness of said multilayer coating by adjusting the energy dose of said localized energy source.

19. The method of claim 9, further comprising adjusting the energy dose of said localized energy source to control the decrease in film thickness with sub-nanometer accuracy.

20. The method of claim 9, further comprising controlling the lateral spatial resolution of the localization of energy deposition produced by said localized energy source.

21. The method of claim 9, wherein the depth of the deformation is controlled by adjusting the exposure time of said localized energy source.

22. An apparatus for mitigating multilayer defects on a reticle used in an extreme ultraviolet lithography (EUVL) system, comprising:

means for positioning an EUVL reticle that includes a substrate with a thin film coating that has a defect; and

means for changing the thickness of said thin film coating in the vicinity of said defect.

23. The apparatus of claim 22, wherein said thin film coating comprises a multilayer coating having multiple layer boundaries, wherein said means for changing the thickness of said thin film coating in the vicinity of said

defect comprises means for interdiffusing at least one layer boundary of said layer boundaries.

24. The apparatus of claim 22, wherein said thin film coating comprises a multilayer coating having multiple layer boundaries, wherein said means for changing the thickness of said coating in the vicinity of said defect comprises means for altering the density of at least one layer of said multilayer coating.

25. The apparatus of claim 22, wherein said thin film coating comprises a multilayer coating having multiple layer boundaries, wherein said means for changing the thickness of said thin film coating in the vicinity of said defect includes means for interdiffusing a plurality of said layer boundaries.

26. The apparatus of claim 23, wherein said means for interdiffusing at least one layer boundary includes means for controlling the multilayer contraction associated with the densification that occurs upon interdiffusion at said at least one layer boundary.

27. The apparatus of claim 26, wherein said means for controlling the multilayer contraction comprises a localized energy source for producing energy for activating said interdiffusion.

28. The apparatus of claim 27, wherein said localized energy source comprises an electron beam source for producing said energy in the form of an electron beam.

29. The apparatus of claim 28, further comprising means for focusing said electron beam.

30. The apparatus of claim 27, wherein said localized energy source is selected from the group consisting of an electromagnetic beam source, an electron beam source and an ion beam source.

31. The apparatus of claim 30, further comprising means for focusing said energy.

32. The apparatus of claim 27, wherein said localized energy source comprises an electrode.

33. The apparatus of claim 22, wherein said thin film coating comprises a reflective multilayer structure.

34. The apparatus of claim 22, wherein said thin film coating is used as a buffer layer, wherein said EUVL reticle further comprises a reflective multilayer coating deposited on said thin film coating.

35. The apparatus of claim 22, wherein said thin film coating comprises Mo/Si.

36. The apparatus of claim 30, further comprising means for adjusting the energy dose of said localized energy source for controlling the decrease in thickness of said multilayer coating.

37. The apparatus of claim 30, further comprising means for adjusting the energy dose of said localized energy source to control the decrease in film thickness with sub-nanometer accuracy.

38. The apparatus of claim 30, further comprising means for controlling the lateral spatial resolution of the localization of energy deposition produced by said localized energy source.

39. The apparatus of claim 30, further comprising means for adjusting the exposure time of said localized energy source for controlling the depth of the deformation.